

Teacher's Guide

Crater of Diamonds State Park

the Fun
the Experience
the Adventure
the Knowledge
the History
the Memories



visit the site where a volcano erupted

start your own rock collection

opportunity to become the next
"Famous" diamond finder

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Come search,
explore and learn...

the experience...

unforgettable...

The world's only diamond site
where you can search and keep what you find.

Welcome to Crater of Diamonds State Park

The staff at Crater of Diamonds State Park would like to invite you and your students for a visit. We have a lot to offer students of any age. The park contains unique geologic formations and wonderful natural habitats. The park provides a great field trip location for classes studying Arkansas, geology, diamonds, nature, or a number of subjects. This handbook was designed to inform educators of the variety of programs we offer at Crater of Diamonds. The park interpreter is also able to perform programs not described in this handbook. If there is a topic you would like your class to learn more about, call the park to see if we have a program that would fit your needs.

Crater of Diamonds State Park's Mission

"The Crater of Diamonds State Park's mission is to preserve, protect and promote North America's only public diamond mine, its geology and history."

General Information

Park hours:

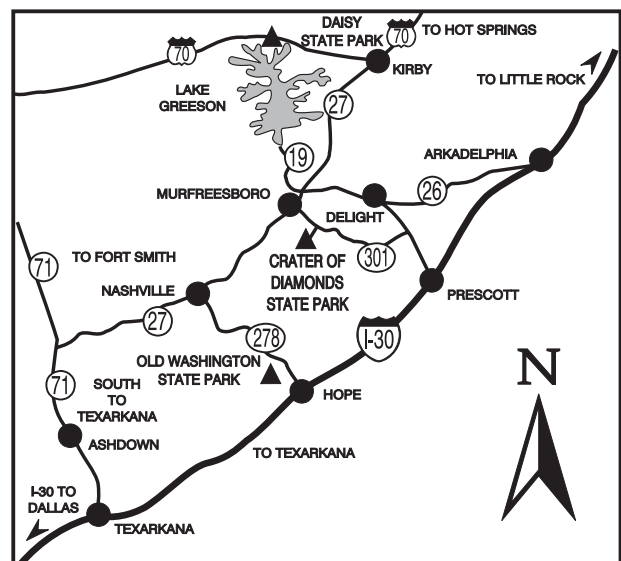
Crater of Diamonds State Park is open year round except for New Year's Day, Thanksgiving, and Christmas. The park hours are 8 a.m. to 5 p.m. daily. From Memorial Day to Labor Day we are open from 8 a.m. to 8 p.m. daily.

Location:

Crater of Diamonds State Park is located 2 miles southeast of Murfreesboro, on Arkansas highway 301. (See map for details)

Admission:

Please call park for current rates: Adult ages 13 and up; Children ages 6 - 12; Children age five and under are free. Organized groups of 15 or more may search for diamonds at one-half the regular fee. Advance notice must be given to obtain reduced group rates.



Planning Your Trip To Crater of Diamonds State Park

Group Leader Information

The following pages explain how to make your reservations to make the most of your visit to the park. Schedule your visit to the park at least two weeks in advance by calling the park at (870) 285-3116 daily between the hours of 8 a.m. and 5 p.m. This helps avoid conflicts with other visiting school groups and allows us to serve you better. Upon arrival, please check in at the Visitor Center and allow time for restroom breaks. We recommend waiting until departure time to visit the gift shop.

When you call to schedule to visit, please have the following information ready:

- ◆ Your name
- ◆ The school name and address
- ◆ School telephone and fax numbers
- ◆ The number of students and the grade level
- ◆ Time of arrival and departure
- ◆ Your preferred and alternate trip dates
- ◆ Your educational objectives for the visit
- ◆ Any necessary accommodations for children or adults with disabilities
- ◆ For groups over 30 the programs will be presented in multiple rotating stations (Teachers need to be sure that they have enough chaperones to monitor students that are not in the program.)
- ◆ Any fees are paid upon entrance to the park - there are no fees for a program, however, there are fees required for entrance to the mine.

Fantastic
Field Trip
Experience!

The kids had so much fun while learning and experiencing the things they have been studying in class.

Preview Visit

It is recommended that the teacher make a preview visit to the park. This will provide contact with the park personnel and allow you to become familiar with locations of restroom, water fountains, exhibits, classroom, trails, and the diamond search area.

- ◆ Visit the park before your trip with colleagues and chaperones.
- ◆ Identify parking, lunch areas, restroom locations, diamond search area.
- ◆ Explore the outdoor areas you plan to visit and consider activities that relate to your classroom studies.

Student Preparation

Studies have shown that students need to know the plan for the day: where they will be, what will be expected of them, and when they will return. Lack of this basic information often causes worry about “what happens next,” to the point that they cannot concentrate on learning during the field trip and/or disinterest occurs.

Be sure your students know:

- ◆ The time and date of departure
- ◆ Point of departure
- ◆ Educational objective of the field trip
- ◆ Necessary expenses
- ◆ To bring a lunch (if eating at the park)
- ◆ To wear appropriate dress
- ◆ To bring parental permission forms as required by the school
- ◆ Rules (of the teacher and the park)
- ◆ To bring field trip supplies (camera, notebook, pencils/pens, etc.)
- ◆ To bring special assignments/worksheets
- ◆ Available free time
- ◆ Time they will return to school

Once you have explained the mechanics of the trip, prepare your students with classroom activities.

Pre-Trip activities for the programs are listed in the last section of this guide.



Dress

The park staff suggests that your group wear old clothes and shoes. The mine search area can be muddy at times and students may wish to wear rain boots. If it should rain, you may still go out on the mine unless there is severe or threatening weather. Please have your group dress accordingly. It is strongly recommended that you bring sunscreen during the spring and summer months.

Gift Shop

Our gift shop is located in the Visitor Center. The park staff recommends waiting until the end of your visit to prevent students losing items purchased out on the mine search area. Inform the park staff at the time of your arrival and they will work out arrangements for shopping. The facility manager limits the number of people shopping to ten at a time with an adult. The remainder of your group may wait outside the building or look through the museum area. Members of your group should be encouraged to make their selections quickly so that others may have their turn.

Lunch

You are welcome to bring sack lunches. We have a day use area that has several picnic tables and grills located near the parking lot across from the Visitor's Center. For groups of 50 or less, the top floor of our Diamond Discovery Center is also available. In the event of inclement weather, your group may be able to rent our day use pavilion. Please contact staff prior to the arrival date of your group if you would like to use the pavilion. In some instances, we may not be able to offer any indoor eating facilities so please have a contingency plan for rain or hot and cold weather. Vending machines are located on the bottom floor of the Diamond Discovery Center. Chips, candy and crackers are sold in the gift shop. We ask that you please dispose of all trash. Please encourage students to separate recyclables and place in the proper receptacles at the Visitor Center or Diamond Discovery Center.

Inclement Weather

In the event of inclement weather, it is at the group leader's discretion if the group goes out on the mine search area. Groups of 60 or less can be accommodated readily in our Diamond Discovery Center Classroom. Groups with over 60 people should contact the park to discuss programming options. Alternate indoor programs or activities may be provided. All groups should contact the park to discuss options PRIOR to the day of your arrival if you would like alternate programming.

Chaperones

It is important that students, whether working as a class or in small groups, have proper supervision. One adult accompanying every 10 students is recommended. All chaperones should clearly understand their disciplinary duties and stay with the students during the field trip. Chaperones are admitted to the diamond search area at the school group rate and teachers are admitted free.

Discipline

Class discipline is the teacher's responsibility. Please explain to all students that appropriate, orderly behavior is expected during their visit. Use simple rules of respect for park resources and courtesy toward each other, keeping in mind that other visitors may be at the park at the same time. While students are allowed to take any rocks and minerals that they may find out on the diamond search area, all plants, trees, and animals are protected by state law and should not be disturbed or removed.

The Geology of "The Crater"

The story of the diamonds recovered at the Crater of Diamonds State Park begins over 3 billion years ago with the formation of diamonds as the stable form of carbon in the earth's mantle. At the tremendous pressures and temperatures some 60 to 100 miles below the earth's surface, diamond crystallized from carbon, and under those conditions it remained stable.

During the past 3 billion years, many geologic changes have taken place on the surface of the earth. Crust formed and was destroyed, continents formed and migrated, mountain ranges were built and eroded away. About 300 to 250 million years ago, the continent we now call South America collided with the southern portion of present day North America. This collision formed the Ouachita Mountains from sediments that were deposited in a deep ocean environment. The Ouachitas began to erode and during the Cretaceous Period (144 to 66 million years ago), the southern area of this eroded mountain range was covered by seas and the area of the Park was near-shore, but under shallow seawater. About 100 million years ago, an instability in the Earth's mantle caused the movement of gas and rock to the surface. This volcanic vent, known as the "Prairie Creek" diatreme by geologists, rose rapidly through the upper mantle and crust, carrying with it fragments of mantle and crustal rocks and minerals, until it came near enough to the surface to explode due to the release of gases. When it exploded, it created an 83-acre funnel-shaped crater with sides sloping inward at about 45 degrees. Much of the airborne material formed by the initial explosion fell back into the vent. The speed of rise of the mass allowed the diamonds to be preserved in this material. Geologists calculate that only about 160 feet of the original vent has been eroded away, concentrating the heavy minerals, including diamond, in the present day soil. Diamonds at the Crater are typically found loose in the soil, having been released during the rapid weathering of this unstable mantle rock.

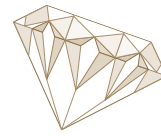
Kimberlite versus Lamproite

The original host rocks, described from Africa and other sites around the world, including those of the Crater of Diamonds were first described as kimberlite and peridotite. But since the discovery of diamonds in Australian "lamproite rocks", many of these localities have been reevaluated. The rock types at the Crater

have been found to more closely resemble lamproite than was previously known, therefore, we now refer to them as "lamproite rocks". Differences are subtle and only by detailed scientific studies can they be determined. We suggest you research these rock names on the internet to learn about them.



The History of "The Crater"



People first began to suspect that diamonds might occur just outside of the quiet town of Murfreesboro, Arkansas, when the precious stones were found in the peridotite soil of Kimberly, South Africa. State Geologist John Branner knew there was an area of peridotite soil just west of Murfreesboro, so he gave the place a thorough surface search in 1889. Unfortunately, he didn't find a diamond.

The first diamonds found in Pike County, Arkansas, were discovered in August 1906 by John Wesley Huddleston. These stones were sent to Charles S. Stiff, a Little Rock jeweler and confirmed to be genuine diamonds. Stiff described them as blue-white diamonds, one weighing 2-5/8 carats and the other 1-3/8 carats. To verify his opinion, Stiff sent them to New York and states that "...after subjecting them to every test they were pronounced diamonds of fine grade."

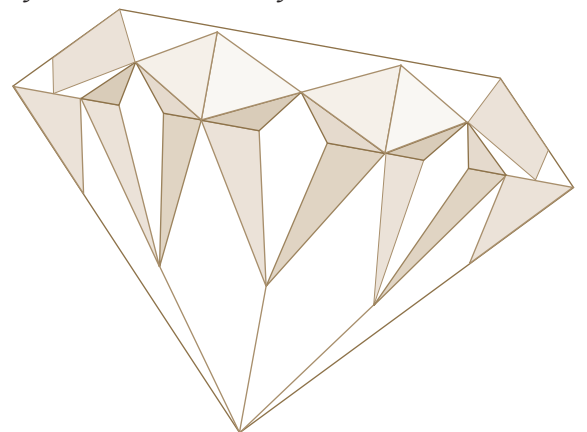
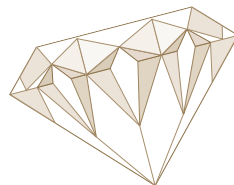
Early in 1906, Huddleston, a farmer, purchased the 160-acre McBrayer farm to make a home for his family, a decision that would etch him into history. Huddleston recounted the first diamond finds to Tom Shiras of the Arkansas Gazette: "I was crawling on my hands and knees ...when my eyes fell on another glittering pebble...I knew it was different from any I had ever seen before. It had a fiery eye that blazed up at me every way I turned it. I hurried to the house with the pebble, saddled my mule and started for Murfreesboro...riding through the lane, my eye caught another glitter, and I dismounted and picked it up out of the dust."



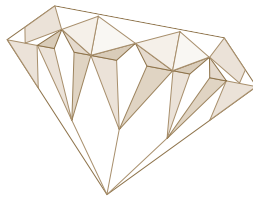
Huddleston sold his diamond-bearing land for \$36,000. According to a book by Howard Millar, It was Finders Keepers at America's Only Diamond Mine, 1976, Huddleston became "...nationally famous, and had acquired the nickname 'Diamond John'." Although he was also known as the "Diamond King," he later met with some misfortunes and died a pauper, but was said to have had no regrets. He is buried in Japany Cemetery, about three miles east of the diamond mine.

The approximate location of Huddleston's first diamond find is designated on the diamond field by a historical marker on the south central mine boundary.

Huddleston's story is perpetuated as a part of the Crater of Diamonds story. He is a unique character in Arkansas history. And, his legend is celebrated in the park's annual June celebration of "John Huddleston Day."



The Diamond Rush



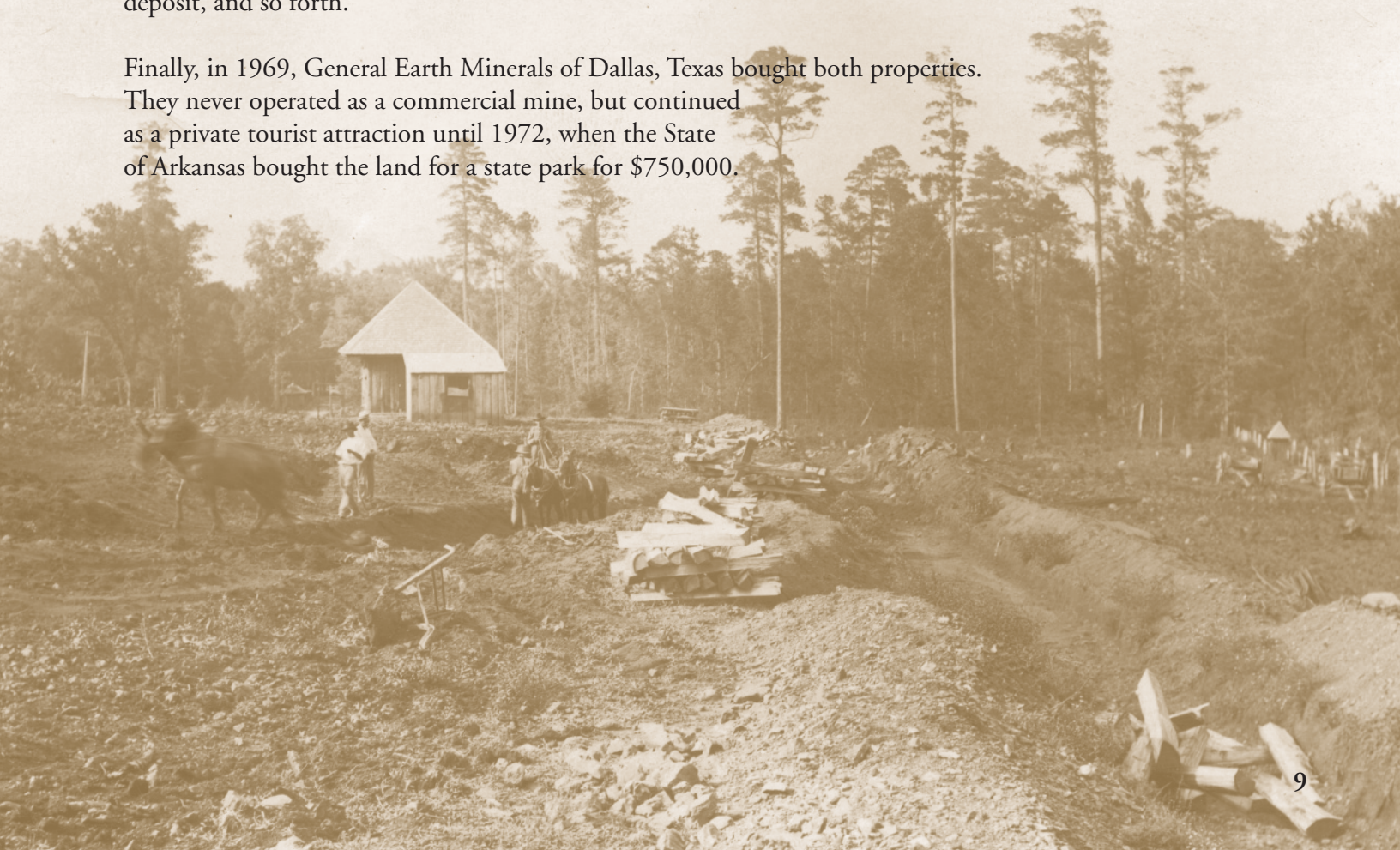
A diamond rush developed as soon as word of the find got out. In fact, the Conway hotel in Murfreesboro is said to have turned away more than 10,000 people who could not be accommodated in just one year. The tent city of Kimberly was established between Murfreesboro and the diamond field, but nothing remains of it today.

The men who bought the Huddleston property began the Arkansas Diamond Company. However, there were 40 acres of land, some of which was diamond bearing soil, that had not been owned by Huddleston. M.M. Mauney owned that land, and he refused to sell. Mauney tried to mine his property, and even allowed visitors to search for a fee. Finally, he sold a $\frac{3}{4}$ interest in the property to Horace Bemis who organized the Ozark Diamond Corporation. However, Bemis died soon after, and his heirs were not interested in diamond mining. Austin Millar and his son Howard bought Bemis' share. The Millars tried to buy out Mauney's $\frac{1}{4}$ share but failed.

The Millars built and operated a small commercial plant that was successful until the entire installation was destroyed by arson on January 13, 1919. They were never able to rebuild.

In 1949, the first real attempt was made to open the diamond deposit to the public. The land was leased from the Millars and opened in 1951 as the Diamond Preserve of the United States. Later, the name was changed to the Crater of Diamonds and was successfully run by Mr. and Mrs. Millar. The adjacent property had passed through various owners and was in the hands of Mrs. Ethel Wilkinson of Logansport, Indiana at the time. She opened her property to the public as The Big Mine, and a fierce battle of the billboards began. During the battle of the billboards, both properties fiercely competed with one another by posting billboards. Each attraction's billboard claimed that one was better than the other, was the largest part of the deposit, and so forth.

Finally, in 1969, General Earth Minerals of Dallas, Texas bought both properties. They never operated as a commercial mine, but continued as a private tourist attraction until 1972, when the State of Arkansas bought the land for a state park for \$750,000.



The Diamonds at "The Crater"



Diamonds by their very nature are extremely small crystals. In fact, the largest gem quality diamond ever found, the Cullinan, weighed only about 1 1/2 pounds (3106 carats) and was not quite the size of a man's fist. By far, the vast majority of diamonds are much smaller in size, typically smaller than an English pea.

Diamonds are the hardest substance known to humans. These carbon crystals are about five times harder than corundum (ruby and sapphire), which is the next hardest mineral. No other known substance will scratch a diamond except another diamond. So enduring are diamonds that the diamonds from "The Crater" are estimated to be from 95 million to 3.1 billion years old.



While diamonds are unscratchably hard, they are actually rather brittle crystals. When hit with a sharp blow, the stones may cleave or shatter. Actually, the diamond industry crushes any poor quality stones for a variety of commercial uses.

In fact, a diamond's greatest value to society is not as a gemstone, but as a tool for industry. About 80% of the world's output of natural diamonds are used to manufacture such things as well drilling equipment, eyeglasses, automobile engines, copper wire, dentistry equipment, surgical tools and much more.

Diamonds feel cool to the touch because their thermal conductivity is the highest of any known nonmetallic substance. Because diamonds are such good heat conductors they can be plunged red hot into cold liquid nitrogen without harm, where most nonmetallic minerals would shatter. This is the main reason why diamonds are used so effectively on the tips of abrasive tools.

As a gemstone, a diamond is rarely exceeded in value. A diamond of high quality, that weighs less than a penny, may be worth more than \$250,000. Few things in the world have as much concentrated value for their size.

To increase the visitor's chance of finding diamonds, the search area is plowed on a regular basis. It is plowed in such a way as to help the natural processes of erosion and weathering.

Soil erosion from the diamond mine's surface has been calculated to average about 64 tons per acre per year over most of the mine, or roughly 2,300 tons per year overall. This is equivalent to a vertical loss of about 1/2 an inch per year.

Diamonds, being relatively heavy, have a tendency to stay in place while lighter soil particles are eroded away. This explains why diamonds continue to be found by surface searchers.

Recent studies have shown the diamond deposit is at least 669 feet deep. There should be diamonds available for many generations to come.



Fun Facts

About the Crater of Diamonds

1. It was said that in 1906, John Huddleston saw some mica flakes glittering in the ground on his farm and thought they were gold. While searching for gold, he found diamonds instead. These were the first diamonds found at the Crater.
2. Diamonds were brought to the surface in the age of the dinosaurs by a series of volcanic eruptions.
3. The diamond mine was never successfully commercially mined for a long period of time; fire, crude mining attempts and theft were contributing factors.
4. The biggest diamond ever found at the Crater was the Uncle Sam, a diamond weighing 40.23 carats.
5. The name Crater of Diamonds was created by Howard Millar who started the first successful tourist attraction at the mine in 1952.
6. In 1972 the state of Arkansas bought the land for \$750,000 and it became a state park.
7. The mine field is a surface mine containing 37.5 acres of plowed soil.
8. Visitors can keep any stone or diamond that they find regardless of size.
9. Rough diamonds are not rough and ugly looking. Rough is the proper term used to describe a diamond that is not cut and faceted. Rough diamonds are often pretty, smooth stones with a metallic shine.



School Programs and Activities

Your park interpreters are certified by the National Association for Interpretation and are trained in Projects WET, WILD, and Learning Tree science-based educational activities. Specialized programs can be developed with a minimum of two weeks advance notice. The programs listed below have been correlated to the Arkansas Science Curriculum Frameworks. A full description of each Curriculum Frameworks is listed in the Appendix.

Diamond the Mighty Mineral

Location: In park.

Objective: Students will learn the importance of diamonds, how they are cut, and how they affect our daily lives.

Grades: K-12

Length: 25 minutes

K-4 Frameworks: ESS.8.K.3; ESS.8.1.2; ESS.8.2.4; ESS.8.4.2; ESS.8.4.6

5-8 Frameworks: ESS.8.5.3; G.1.AH.7-8.5

9-12 Frameworks: G.1.AH.9-12.5

The Crater Rocks!

Location: In park.

Objective: The Crater has over 40 different rocks and minerals that occur naturally on the field. Students will learn about some of these rocks and minerals and how to identify them.

Grades: K-12

Length: 25 minutes

K-4 Frameworks: ESS.8.3.1; ESS.8.3.2; ESS.8.3.4; ESS.8.3.7; PS.5.K.1; PS.5.1.1; PS.5.2.1; PS.5.3.1; PS.5.4.1

5-8 Frameworks: ESS.8.5.1; ESS.8.5.4; ESS.8.5.5; ESS.8.5.6; ESS.8.5.7; ESS.8.5.8; ESS.8.5.9

9-12 Frameworks: PD.1.ES.4

Colors in the Rocks

Location: In park

Objective: Color is very important in nature and the Crater has lots of colors. Students are encouraged to find different colors during a hike on the search area.

Grades: K-2

Length: 20 minutes

K-4 Frameworks: PS.5.K.1; PS.5.1.1; PS.5.2.1

Crater Time Machine

Location: In park

Objective: Students will go back through time as they hike along the search area and learn the stories behind some of the famous diamonds that have been found at the Crater.

Grades: 4-12

Length: 30 minutes

K-4 Frameworks: H.6.4.7; H.6.4.9

5-8 Frameworks: W.7.AH.7-8.3

9-12 Frameworks: W.7.AH.9-12.4; G.1.AH.9-12.4

Geology of the Crater

Location: In park.

Objective: Students will learn about the events that occurred nearly 100 million years ago in order for the Crater to appear as it does today.

Grades: 3-12

Length: 25 minutes

K-4 Frameworks: ESS.8.3.5; ESS.8.3.6; ESS.9.4.1

5-8 Frameworks: ESS.8.6.1; ESS.8.6.6; ESS.8.6.9; ESS.9.6.1; ESS.9.8.1; ESS.9.8.2

9-12 Frameworks: PD.1.ES.2; PD.1.ES.8

History of the Crater

Location: In park.

Objective: Students will learn about the park's unique, and colorful past, including the finding of the first diamonds in Pike county.

Grades: 4-12

Length: 25 minutes

K-4 Frameworks: H.6.4.7; H.6.4.9

5-8 Frameworks: ESS.8.6.6; ESS.8.6.9; G.1.AH.7-8.4; W.7.AH.7-8.3; WWP.9.AH.7-8.12;

9-12 Frameworks: WWP.9.AH.9-12.8; W.7.AH.9-12.4 ;G.1.AH.9-12.4

Rock Hound Hike

Location: In park.

Objective: Students will join an interpreter on a hike to identify and collect several of the rocks and minerals that occur naturally at the Crater.

Grades: 3-8

Length: 25 minutes

K-4 Frameworks: ESS.8.3.1; ESS.8.3.2; ESS.8.3.3

5-8 Frameworks: ESS.8.5.5; ESS.8.5.6; ESS.8.5.7; ESS.8.5.8; ESS.8.5.9

Rock and Mineral Magic

Location: In park

Objective: Students will discover secrets and uses of some of the rocks and minerals that occur at the Crater.

Grades: K-8

Length: 20 minutes

K-4 Frameworks: ESS.8.3.1; ESS.8.3.2; ESS.8.3.3; ESS.8.3.4; ESS.8.3.7; PS.5.K.1; PS.5.1.1; PS.5.2.1

5-8 Frameworks: ESS.8.5.3; ESS.8.5.4; ESS.8.5.5; ESS.8.5.6;

Additional programs offered:

Interpreters create an atmosphere of fun and learning as students use facts that they have studied to answer questions in these spin-offs of favorite family games. Lots of education packed into lots of fun!

* The Fact is Right

* Who Wants to be a Diamond Miner

* CMI: Criminal Mineral Investigator



All About Diamonds

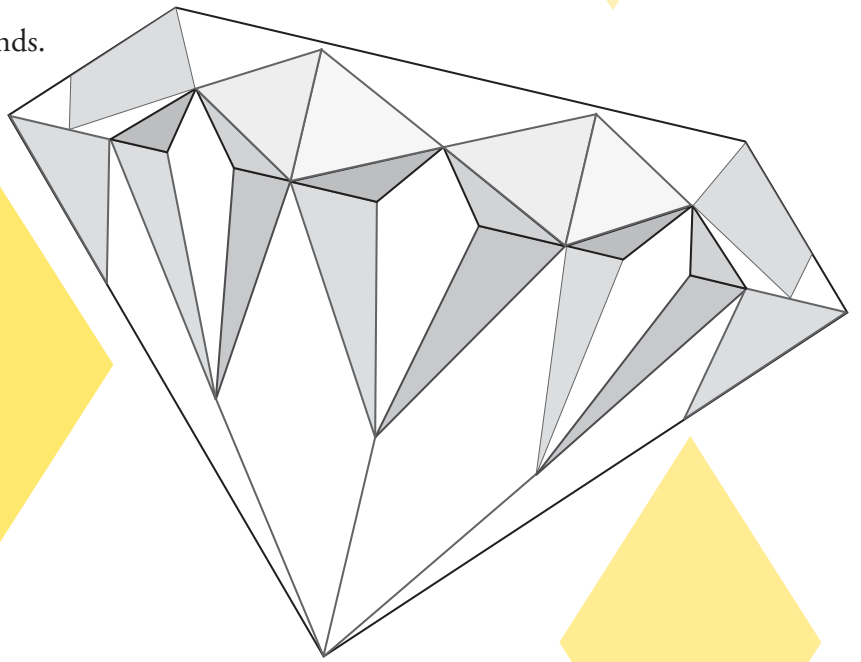
Read the following paragraphs, then answer the questions.

Diamonds by their nature are extremely small crystals. In fact, the largest gem-quality diamond ever found (the Cullinan) weighted only about 1 1/2 pounds (3,106 carats) and was not quite the size of a man's fist. By far the vast majority of diamonds are much smaller in size, typically smaller than an English pea.

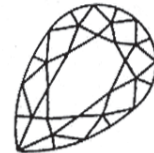
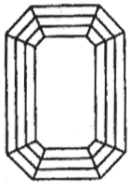
Diamonds are the hardest substance known to humans. These carbon crystals are about five times harder than corundum (ruby and sapphire), which is the next hardest mineral. No other known substance will scratch a diamond except another diamond. So enduring are diamonds that the diamonds from the Crater are estimated to be from 95 million to 3.1 billion years old! While diamonds are unscrathably hard, they are actually rather brittle crystals. When hit with a sharp blow, the stones may cleave or shatter.

Rough diamonds found at the Crater are shiny metallic stones with rounded smooth edges. Rough diamonds are also oily in nature so dirt will not stick to them. They tend to be completely clean in their natural state and stand out from every other stone on the mine.

1. How large are most diamonds?
2. How old are diamonds at the Crater?
3. How can a diamond be scratched?
4. How big was the largest gem-quality diamond ever found?
5. Name three characteristics of rough diamonds.
6. Can diamonds be broken, yes or no?



CRATER OF DIAMONDS WORD PUZZLE



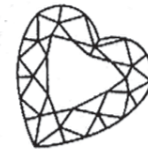
A	S	T	A	T	E	P	A	R	K	M	I	N	E	A
J	H	E	C	A	F	R	U	S	Y	S	A	E	R	G
O	I	U	N	C	L	E	S	A	M	L	O	O	K	A
H	N	P	L	A	T	E	M	O	V	E	M	E	N	T
N	E	R	U	S	S	E	R	P	O	M	E	R	M	E
H	S	F	I	U	C	G	E	O	L	O	G	Y	I	A
U	L	I	S	N	O	Q	N	C	C	L	Y	T	N	K
D	I	N	O	S	A	U	R	D	A	I	A	A	E	A
D	K	D	E	D	I	A	M	O	N	D	E	E	R	M
L	E	E	T	M	T	R	M	O	O	C	N	H	A	E
E	M	R	I	E	N	T	E	N	O	T	S	D	L	T
S	E	S	R	G	M	Z	I	P	O	I	N	T	S	H
T	T	C	A	R	A	T	N	H	I	S	T	O	R	Y
O	A	E	B	E	T	I	C	L	A	C	F	U	N	S
N	L	M	U	R	F	R	E	E	S	B	O	R	O	T

Find these words hidden up, down, backwards, or diagonally through this puzzle. Left over letters will spell out a unique fact about the mine. You don't have to find the words in (parentheses).

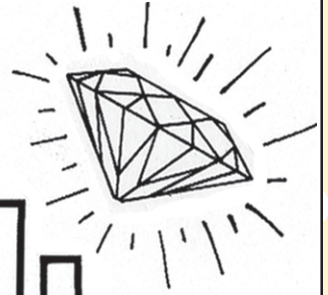
agate
amethyst
barite
calcite
carat
crater
deer (and other wildlife)
diamond
dinosaur
finders (keepers)
fun
gem

geology
greasy surface
heat
history
John Huddleston
keen
look
mine
minerals
Murfreesboro
ocean
plate movement

point
pressure
quartz
shines like metal
state park
stone
sun
Uncle Sam
volcano



A DIAMOND MINER'S MAZE



Can you help the diamond miner find the diamond?

Registration Form

Crater of Diamonds State Park

School Name _____

School Address _____

Grade _____ Number in Group _____ Contact Person _____

School Phone _____ Best Time to Call _____

Fax _____ email: _____

I prefer to be contacted by: _____ Phone _____ Fax _____ Email _____ Mail _____

State Park Information:

Month and Day

Arrival/Departure Time

1st choice _____

2nd choice _____

Special needs or interests of my class _____

My class would like to participate in the following program _____

My class will visit the gift shop _____ Yes _____ No

Return this form to:

Park Interpreter/Superintendent

Crater of Diamonds State Park _____ 209 State Park Road _____ Murfreesboro, AR 71958

Phone: (870) 285-3116 _____ Fax: (870) 285-2897

Email: craterofdiamonds@arkansas.com

Appendix

K-4 Frameworks:

- ESS.8.K.3 _____ Classify resources as natural or man-made.
- ESS.8.1.2 _____ Identify common uses of Earth's resources.
- ESS.8.2.4 _____ Identify products derived from natural resources.
- ESS.8.4.2 _____ Analyze the impact of using natural resources.
- ESS.8.4.6 _____ Evaluate human use of Arkansas' natural resources on the environment.
- ESS.8.3.1 _____ Distinguish among Earth's materials.
- ESS.8.3.2 _____ Classify rocks by their properties.
- ESS.8.3.3 _____ Identify the three categories of rocks.
- ESS.8.3.4 _____ Identify the physical properties of minerals.
- ESS.8.3.5 _____ Identify areas in Arkansas that are the main sources of the mineral: diamond.
- ESS.8.3.6 _____ Identify the layers of Earth.
- ESS.8.3.7 _____ Identify common uses of rocks and minerals.
- ESS.9.4.1 _____ Analyze changes to Earth's surface.
- H.6.4.7 _____ Identify major historical events that occurred during the 20th century.
- H.6.4.9 _____ Evaluate data present on a timeline of Arkansas history.
- PS.5.K.1 _____ List and classify objects according to the single properties of size, color, shape.
- PS.5.1.1 _____ Compare and contrast objects according to the single properties of size, color, shape, texture, magnetism.
- PS.5.2.1 _____ Classify objects based on two or more properties.
- PS.5.3.1 _____ Compare and contrast objects based on two or more properties.
- PS.5.4.1 _____ Demonstrate multiple ways to classify objects.

5-8 Frameworks:

- ESS.8.5.1 _____ Identify some basic elements composing of minerals.
- ESS.8.5.3 _____ Identify characteristics of minerals.
- ESS.8.5.4 _____ Conduct investigations on mineral properties
- ESS.8.5.5 _____ Identify minerals: quartz, diamonds, gypsum, calcite, hematite.
- ESS.8.5.6 _____ Identify minerals found in Arkansas.
- ESS.8.5.7 _____ Identify characteristics of sedimentary, igneous, and metamorphic rocks.
- ESS.8.5.8 _____ Compare and contrast by investigation characteristics of the three basic types of rocks.
- ESS.8.5.9 _____ Classify the three basic types of rocks.
- ESS.8.6.1 _____ Identify and diagram the layers of the Earth.
- ESS.8.6.6 _____ Explain how volcanic activity relates to mountain formation.
- ESS.8.6.9 _____ Research local, regional, and state landforms created by internal forces in the earth.
- ESS.9.6.1 _____ Research methods of determining geologic time.
- ESS.9.8.1 _____ Explain processes that have changed Earth's surface that have resulted from sudden events and gradual changes.

5-8 Frameworks continued:

- ESS.9.8.2 _____ Analyze how rock sequences may be disturbed.
G.1.AH.7-8.4 _____ Research the origins of key place names in Arkansas.
G.1.AH.7-8.5 _____ Examine the economic effect of Arkansas' natural resources.
W.7.AH.7-8.3 _____ Explore the effects of tourism on the economy.
WWP.9.AH.7-8.12 _ Identify significant contributions made by Arkansans.

9-12 Frameworks:

- G.1.AH.9-12.4 _____ Research the origins of key place names in Arkansas.
G.1.AH.9-12.5 _____ Examine the economic effect of Arkansas' natural resources.
PD.1.ES.2 _____ Relate eras, epochs, and periods of Earth's history to geological development.
PD.1.ES.4 _____ Categorize the type and composition of various minerals.
PD.1.ES.8 _____ Describe the relationships of degradation and tectonic forces.
W.7.AH.9-12.4 _____ Explore the effects of tourism on the economy.
WWP.9.AH.9-12.8 _ Research significant contributions made by Arkansans.



amazing opportunities



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